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BULLETIN

OF

THE NEW YORK ACADEMY OF MEDICINE

JULY, 1931

INCORPORATED 1851

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ANNUAL GRADUATE FORTNIGHT

MENINGOCOCCUS INFECTIONS INCLUDING MENINGITIS*

W. W. Herrick
Visiting Physician, Presbyterian and Sloane Hospitals

Any facts about an infection for which we have a satisfactory treatment have double value. Happily meningococcus infections are in this class. It may therefore be profitable to review such recent advance in knowledge of this disease as may be of value and at the same time to go over well established essential facts about it.

Because the meningococcus is an obligatory human parasite and does not infect lower animals under ordinary conditions, knowledge of this disease must be derived largely from the bedside. For this reason the clinician and pathologist are in position to speak with more authority than is the experimental worker.

Within recent years no facts of importance in regard to the bacteriology and immunology of this disease have been forthcoming. Authorities are still somewhat vague about the mechanism of immunity. Present opinion accords to phagocytosis and agglutination the most prominent place in this process. The organism has been found in almost every organ of the body. It has been repeatedly shown in the air passages throughout their entire extent; in the pleura, pericardium, peritoneum, circulating blood, endocardium, skin, joints, meninges, and middle ear. It has

*Delivered October 31, 1930.

been associated with endocarditis, septicemia, meningitis, pneumonia, pleurisy, peritonitis, epididymitis, adrenal necrosis and hemorrhage, encephalitis, suppuration of the paranasal sinuses, tonsillitis and pharyngitis. Being one of the pyogenic cocci, it produces pus wherever it may lodge. In many of its clinical and laboratory properties, it is analogous to the pneumococcus. Like the pneumococcus the meningococcus is a variable species. It may be divided into definite groups or types with varying immunological properties. It may be that these groups are not fixed but vary in different epidemics and from time to time in a given epidemic, thus defying arbitrary classification. The recognition of this matter is of the utmost importance in the preparation and administration of anti-meningococcus serum.

One may conveniently and logically divide infections with this organism into three stages: The first, or carrier stage, is an involvement of the upper air passages. The oro- or nasopharynx, tonsils, and paranasal sinuses are singly or severally involved in every active case. This involvement is usually of short duration amounting to a few days. It may be followed by the other phases of the disease or the process may go no further.

There are chronic carriers who continuously or intermittently emit the meningococcus in the nasal discharge and sputum. These may be transitory, intermittent or permanent hosts of this micrococcus. These individuals keep the infection alive during non-epidemic periods. It is probable that the chronic carrier is himself immune to the infection.

The infection may not go beyond this first or carrier stage. This seems to be borne out by the observed frequency of mild infections of the upper respiratory tract in communities in which meningococcus infection is rife. Coryza, pharyngitis, sinusitis or tonsillitis with the diplococci obtainable sometimes in pure culture may occur as an isolated manifestation of this infection. The exudate in the nasopharynx and oropharynx is very viscid and

patches which may appear on lymphoid tissue are superficial and grayish, never very dense. In addition there is much local congestion. There may be a mild toxemia or no symptoms of importance.

The second stage of this infection is a bacteremia. Demonstration of this stage, which is the direct result of clinical studies made during the World War, has apparently solved the long debated question as to the avenue of transport of the diplococci from the upper air passages to the meninges. It may be said that the proof of a meningococcemia is ample and has been obtained under conditions of both military and civilian life. On the contrary, satisfactory volume of proof of the direct transmission of the infection from the nasopharynx or paranasal sinuses to the meninges is lacking. The clinical picture of meningococcemia is quite definite and may be readily recognized by the alert and experienced clinician. With or without the preliminary infection of the upper air passages, the patient suddenly becomes prostrated and febrile. The temperature in the average case is around 102. It may be subnormal. It may be very high. Frequently there is chill at onset. Of striking interest is the effect of the toxin on the higher centers. Patients are stupefied. The expression is characteristically blank. Replies are in monosyllables. Active delirium is rare. There is a tendency to lie quietly, to take little note of surroundings and to resent interference. Attempt at movement is resisted in a protesting querulous manner. Movement is painful. There is complaint of a general soreness and aching all over the body which may simulate acute polyarthritis. The skin gives us very valuable evidence at this stage of the disease. There is evidence of a vasomotor disturbance. Patients present a mottled pallor sometimes with a patchy suffusion of the face. There is a redness of the conjunctivæ. Tache cérébrale may be observed. Almost diagnostic is the hemorrhagic rash. Pathologically this consists of minute hemorrhages into the skin. Usually of pin-head size, these may reach a diameter of several inches or in fulminating cases amount

to a diffuse purpura. Like other hemorrhagic rashes, they do not disappear on pressure. They continue bright for two or three days when they fade leaving a rusty stain. Most commonly they occur about the shoulder and pelvic girdle; in more severe cases, over the trunk, conjunctivæ, mucosa, extremities or even the face. They come out very quickly and within one to two hours a patient previously without skin lesions may show an astounding number of these purpuric spots. From these the ancient term "spotted fever" arises. In some severe cases large hemorrhagic areas will undergo necrosis resulting in considerable and often deep destruction of skin and even of muscle. Such lesions are very suggestive of vascular thrombosis. At necropsy these hemorrhagic lesions are apparent on all the serous surfaces. They are undoubtedly the cause of the early arthralgia or arthritis so common in the septic stage of meningococcemia. In the more chronic cases, particularly the relapsing types without meningitis, one sees a maculo-papular roseola very like the rose spots of typhoid fever except in size. Many of these spots are one-half inch in diameter. They are most common on the trunk and appear in groups. Usually they are rather sparsely distributed. They have been mistaken for chicken pox, typhoid fever or erythema nodosum.

Among the laboratory findings in meningococcemia a high polymorphonuclear leucocytosis is almost constant. In no other disease excepting pneumonia is there such an early and marked leucocytosis. The pulse is rapid. The blood pressure is low. The meningococcus may be obtained from the upper air passages; from the blood stream by appropriate blood culture methods or on direct smear; from the skin lesions and even from the clear cerebrospinal fluid. If detailed proof of a meningococcemia were required, one might find it in the reports of positive blood cultures obtained in the stage of the disease under discussion. In an epidemic in the army in 1917-18 in 12 consecutive cases under my own study a positive blood culture was obtained in 10. McLean and Caffey reported 14 positive blood cul-

tures in a series of 17 cases in children. Smithburn et al. reported 63.8 per cent of positive blood cultures in 119 cases. McLean and Caffey obtained meningococci on smear from the hemorrhagic skin lesions of children. Symptoms of meningeal irritation may be entirely absent at this stage or they may occur simultaneously with it. In some epidemics the stage of meningococcemia has recognizable duration from a few hours to a few days before the development of meningitis.

The metastatic phase of meningococcus infections is the one with which most of us are familiar. The meninges are involved in at least 90 per cent of the cases. This may occur so early as to appear to be the initial process of the disease. However, in epidemics in which control of material is possible and study can be carried out from the onset of any symptoms whatsoever, conditions such as obtain in military camps, in hospitals, industrial or other organizations, the early phase of this infection can usually be detected. It is probable that epidemics differ and that in some, certain of the septic manifestations of the disease are not prominent.

It is not necessary to recount in detail the symptoms and signs of meningitis. The bursting headache, vomiting, the frequent delirium, the irritability, the stiff neck, and the findings on lumbar puncture are known to every clinician.

Of special interest is the prevalence and the picture of the disease in small infants. This has been studied especially by McLean. This observer found that in addition to the classical signs of meningitis, a failure to nurse properly, an excessive irritability, bulging fontanel, ophthalmoplegia, or a Cheyne-Stokes' respiration in infants make important the consideration of a meningococcus meningitis.

The spinal fluid presents certain well defined phases in this disease. In the stage of meningococcemia it is clear, contains a normal amount of cells and usually a few extra-

cellular isolated diplococci. These may be obtained on culture when they are not found on smear of the centrifugalized specimen. An increase in globulin and in cells follows soon. At first the cells are largely mononuclear in type, probably desquamated ependymal cells; later polymorphonuclears appear in quantity. In a few hours polymorphonuclear cells are from 90 to 100 per cent of the white cells present while fibrin, red blood cells and meningococci complete the picture. At first the organisms are largely or wholly without the cells but as the process matures they become intracellular in localization. With satisfactory response to serum therapy or a spontaneous recovery, the polymorphonuclear cells gradually give place to lymphocytes, organisms disappear, the fluid gradually becomes clearer and less in quantity. A condition of hypersecretion of the fluid and increased pressure in the subarachnoid system may last for some time after the fluid approaches the normal in all other respects.

Certain mechanical accidents of the disease are of importance. In the early stages of meningitis there may be a great increase in the bulk of the entire encephalon due not only to the meningeal exudate but also to extreme congestion and to an encephalitis which may be characterized by engorgement of the vessels, edema and a perivascular exudate. The not infrequent encephalitis of meningococcus infection has been little stressed. This lesion may take the form of localized hemorrhagic and purulent exudate in the brain substance and may well account for some of the persistent symptoms in cases not yielding to treatment. The result of an acute increase in the bulk of the encephalon may be a wedging of the brain stem in the foramen magnum. Clinically this is evidenced by intense engorgement of the face and veins of the forehead, bursting, agonizing headache, wild delirium, often with a slow pulse and other evidence of increased intracranial pressure. Sudden death may result. In addition to the specific therapy, management should be by venesection, by

the use of Epsom salts in the alimentary tract and by injections of glucose intravenously.

The subarachnoid system is an accessory circulation. The fluid courses from its point of origin in the choroid plexus through the foramen of Monro, the aqueduct of Sylvius, the fourth ventricle, thence through the foramina of Luschka and Magendie to the subarachnoid spaces covering the brain, cerebellum and cord. Absorption into the lymphatic stream is by the pacchionian bodies and the sheaths of the cranial nerves. In meningitis organized exudate may close this circuit at any point resulting in accumulation of fluid and distention of the ventricles or other subarachnoid spaces proximal to the point of occlusion. This condition is known as subarachnoid block. It most commonly occurs at the foramina of Luschka and Magendie, occasionally in the aqueduct, rarely in a foramen of Monro or about the cord. In some cases defective absorption from the entire drainage field may account for hydrocephalus without obvious local subarachnoid occlusion. This state may be combined with hypersecretion. The result of block is an acute hydrocephalus or hydrocephalic meningitis. The important symptoms are increase in meningeal irritation, obtunded mentality, an irregular, intermittent temperature, rapid trophic disturbance characterized by wasting so that the patient may become almost a living skeleton; evidence of increased intracranial pressure as shown by slow pulse and elevated blood pressure, sometimes by choking of the optic disk. At necropsy one finds great distention of the ventricles and flattening of the convolutions. If unrelieved, death is almost certain. In some cases in children a chronic hydrocephalus results.

Polyarthritis is a prominent symptom in the early stages. It is probably associated with hemorrhage into the joint membranes. It may be very acute and a source of bitter complaint. It is one of the factors that compels the patient to remain quiet and immobile. This type of arthritis is transitory and clears away with the hemorrhagic rash. Another type is a mono-arthritis, usually affecting the

knee, occasionally other large joints. It is characterized by purulent exudate in which meningococci can usually be found. It is subacute in its course, rather late in its appearance, is of good prognostic omen and, after a variable duration, clears away without leaving any disability. An interesting feature is the relatively painless character of this meningococcic mono-arthritis. Swelling and exudate may be great but spontaneous pain or pain on movement is very slight. Cases of this kind may occur without meningitis. A relatively painless arthritis of the larger joints in which the local features are more prominent than the symptoms and in which the course is prolonged and particularly when accompanied by a maculo-papular rash should bring into consideration a general infection with the meningococcus. Not infrequently cases of this type are called purpura rheumatica, a term which may give verbal satisfaction but which should never be accepted as a final diagnosis.

Pericarditis is not infrequent. It is of the sero-purulent or fibrino-purulent type. While a serious complication, it is not necessarily fatal. It may be attended by a large amount of exudate requiring paracentesis.

Endocarditis is very infrequent. It is of the vegetative type and may involve either side of the heart. It is practically always fatal.

Meningococcic pleurisy, while rare, may occur and offers about the same problem as meningococcic pericarditis. It is doubtful if the pneumonia often associated with meningococcic infections is due primarily to this organism. Peritonitis does occur although very rarely. Epididymitis is a factor in some epidemics. It is not a florid process. Cases seldom have any symptoms except the local swelling which in my experience subsides without subsequent atrophy.

The eye may play an important part in the symptomatology of this disease. In the initial stage conjunctivitis is a feature. In the bacteremic stage petechial spots of

varying size occur in the conjunctivæ. Strangely enough these are not found in the retina. Meningococcic panophthalmitis is one of the most disturbing symptoms of the disease. Careful observation of its onset does not suggest that the avenue of infection is by the optic nerve sheaths; rather does it seem to indicate that the infection is from the blood stream. An intense congestion of the vessels of the sclera with severe pain and increased tension is the first feature. Rapidly the media become cloudy. Then the eye becomes infiltrated with pus. The tension later falls and the eye is destroyed. In only one case, that reported by McLean and observed by myself at the Babies' Hospital, has there been recovery after this process had become established. In this case there was complete restoration of vision. Usually, however, the sight is destroyed and the eye requires enucleation. I have more than once seen this process affect both eyes. From experience I am sure that enucleation in these cases should be deferred until the process becomes well walled off and active sypmptoms of the disease have been absent for some weeks.

Of the cranial nerves the first is very rarely affected. Anosmia may rarely be observed. The ophthalmic nerve may give evidence of increased intracranial pressure in choked disk in later stages of the disease especially with hydrocephalus. Intense engorgement of the retinal veins and of the optic disk is not an infrequent feature of the early phases of this infection. The third nerve may show irritation or paralysis, giving rise to the strabismus which is so common in the meningitic phase. The sixth nerve owing to its long and exposed course at the base of the brain is very likely to show symptoms of irritation or paralysis. The fifth nerve apparently escapes injury in this disease. The facial nerve is not infrequently affected especially in children, giving rise to facial spasm or paresis. Affection of the eighth nerve is common. The deafness which results is unfortunately in almost all cases permanent. The remaining cranial nerves are not seriously affected unless we mention the bradycardia which is the

probable result of increased vagus stimulation from the rise of intracranial pressure. Cheyne-Stokes' or Biot's breathing may also have a similar origin.

Course

Few infections have a more variable course. Death may come with startling suddenness. Numerous instances of death four hours after onset have occurred. Abortive cases occur without the development of serious systemic or local symptoms. Typical cases may run their course for weeks. Relapses may occur so that the patient is afflicted for several months.

Factors in duration are the severity of the infection and the response to serotherapy. The prognosis in an individual case had best never be made. No one can give a satisfactory prediction of the outcome in a given case. Unfavorable features are great abruptness of onset with a high or subnormal temperature, great prostration, extensive hemorrhagic rash, polyarthritis or such complications as endocarditis, pericarditis, hydrocephalus, extensive cranial nerve involvement and particularly a lack of response to treatment with serum. Most important of all in prognosis is the promptness of diagnosis and treatment. If adequate amounts of suitable serum can be given within forty-eight hours of onset, the mortality should not be above 12 per cent. If the diagnosis is tardy and serum therapy deferred until later, the mortality tends to rise about 10 per cent for each twenty-four hours of delay.

Cases with a very low or a very high leucocyte count and with a very high percentage of polymorphonuclear cells are likely to do badly. Extensive purpura is a death warrant. Occasionally in grave cases the spinal fluid will show little or no cellular reaction but myriads of meningococci. Such are always fatal. Fortunately most cases that recover recover completely. A period of nervous and muscular asthenia, of intolerance of sunlight, of headache, may be observed. Rarely in children deaf mutism may result or chronic hydrocephalus with its mental and physical

symptoms. Blindness of central origin is likely to be transitory. When of peripheral origin it is permanent.

Treatment

Treatment is one of the most important chapters in medicine. Every practicing physician should have a clear picture of the early features of this disease and a well planned course of action in the event of its recognition.

Of the general treatment of meningococcus infections little need be said. Quiet is essential. Strong light should be avoided. Pain should be relieved by ample doses of opiates. The specific treatment should be carried out promptly and thoroughly. In this disease half way measures are not to be tolerated. In the early phases of the infection each hour counts and delay may incline the balance between life and death. Among experienced clinicians there is little debate about methods of serum therapy. When the diagnosis has been made early in the stage of bacteremia, it is obvious that intravenous therapy is required. Intravenous therapy is also valuable in the early stages of the metastatic or meningeal stage. Its advantages are that one can give a large volume of antibody. An argument of the opponents of intravenous therapy is that it is unnecessary since serum given intraspinally finds its way into the blood stream. While this is a fact, a fact of greater importance is that the amount of serum that can be given by the intraspinal route is limited. Rarely more than 35 c.c. can be administered intraspinally. Experience has shown that intravenous therapy to be effective must be a massive therapy, the average adult requiring doses of 100 c.c. of serum. A more valid argument in opposition to intravenous therapy is that reactions occur and are sometimes serious. This is true of any intravenous serum treatment. Despite all precautions, grave and even fatal accidents may occur occasionally. The patient, however, is in less danger from serum reactions than he is from an inadequately treated meningococcus infection. The lesser danger lies in thorough treatment.

The outline of the treatment of an average case of men-

ingococcus infection may be given. If the diagnosis is made within four days of onset or if petechial hemorrhage or other evidence of systemic infection is present, the average adult should receive 100 c.c. of antimeningococcic serum in the vein. This should be repeated in from six to eight hours if the condition is serious; in twelve to twenty-four hours if the symptoms appear to be under control. Usually three intravenous treatments are adequate. These should be given with every possible precaution against anaphylaxis. Sensitization of the skin should be determined beforehand. An injection of a small amount of serum should be given under the skin. If the patient seems sensitive, desensitization by increasing amounts of serum should be carried out. When administering serum the first 15 c.c. should be introduced at the rate of one c.c. a minute, observing the patient carefully for palpitation, dyspnœa, urticaria, precordial distress, collapse or other evidence of sensitiveness to serum. If this point in the serum administration is passed without serious effect, the rest of the treatment may be given without delay. Further intravenous serum treatments are very unlikely to result in distressing symptoms. Daily intraspinal treatments should be begun as soon as the spinal fluid becomes cloudy. Under ordinary conditions diagnosis is not made until this occurs. In patients whose symptoms are relatively mild, intraspinal treatments alone will suffice. However, if there is evidence of toxemia and of a severe infection, in my opinion, intravenous treatment should be used despite tardy recognition of the disease. The average case requires four to six intraspinal treatments. Some will need as many as twenty.

Fundamental in serotherapy of this disease is the use of a serum containing the antibodies specific for the type of meningococcus concerned. It must be thoroughly recognized that serums vary in their antibody content and that the meningococcus is not a fixed species. In the treatment of every case, therefore, we must recognize two variable

factors; the organism and the serum. Excepting the therapeutic effect there is no satisfactory way in which the efficacy of a serum can be measured. Next to the result of its administration to the patient, the agglutinin content is most reliable as a test of therapeutic efficacy. To be effective therapeutically the serum should agglutinate the organism obtained from the patient's air passages, circulating blood, skin or meninges in at least 1 in 50; better 1 in 800 or 1200.

If the response to serum is not prompt and effective, if the improvement in the patient's condition is not striking one must immediately discard the serum used and obtain some from another source in the hope that this second serum will contain the necessary antibodies. This is a fundamental rule of which no practitioner should be unaware.

The cause of continued symptoms must be sought in a number of directions. An overwhelming type of infection may be present in which case death is not long delayed. Treatment may have been inadequate or the serum used may not be adapted to the type of infection concerned. Some complication may have arisen. Those to be looked for are pneumonia, pericarditis, endocarditis, arthritis, epididymitis, subarachnoid block, encephalitis, cerebral or cerebellar abscess. After the seventh day serum sickness must be regarded as a possible cause of persistent symptoms. It is often difficult to decide when to stop treatment. Such a decision is important because it is quite possible to overdo treatment.

In the later phases of the disease one may meet a condition in which there is a slight irregular fever with other persistent symptoms and in which each intraspinal treatment is followed by an increased meningeal irritation. At this point careful study of the spinal fluid should be made. If organisms cannot be found on smear or culture, if lymphocytes are 10 or more per cent of the cells present in the fluid and if the cell count is lessening, one is usually

safe in considering that the infection is under control. In this event all serotherapy should be omitted. The spinal fluid should be withdrawn daily or on alternate days for careful study. If polymorphonuclear cells increase in number and proportion, if organisms reappear or if symptoms of infection do not abate, intraspinal treatment may be renewed cautiously. Usually, however, it is best to let nature take its course and the patient will promptly get well if let alone. In the later stages of the meningococcus meningitis, a hypersecretion of fluid may be annoying. There is persistent meningeal irritation with headache. Lumbar puncture obtains a large amount of fluid under considerable pressure. The fluid is not likely to be very cloudy and contains comparatively few cells and no organisms. In a case of this kind one should not give serum but should drain by the lumbar route if such drainage is followed by relief. The outlook is usually good in this situation.

Treatment of other metastatic purulent foci as in arthritis, pericarditis, etc., is by the withdrawal of pus and the local injection of meningococcus serum.

Treatment of the mechanical accidents of the disease is most important. If unrelieved, they are fatal. Cistern puncture is of great value in spinal subarachnoid block as it makes drainage effective and serum administration possible. This measure is also of use in the not infrequent block at the foramina of Luschka and Magendie. If block has occured higher up in the aqueduct of Sylvius or foramina of Monro, one must resort to ventricular puncture either through the fontanel in children or the corpus callosum in adults. One should not hesitate to establish this drainage. Serum may be administered into the ventricles at the same time. Radical surgical measures such as constant drainage are probably unwise. Recurrences are not infrequent, sometimes after an interval of several months. Necropsy studies have revealed that the typical exudate in the meninges is absorbed very slowly. This probably acts as a nidus of infection. To ward off recurrences it seems wise to give vaccines to the convalescent. One might sug-

gest one-half billion of killed meningococci subcutaneously at intervals of a week for three or four doses.

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DIET IN DISEASE

EUGENE F. DUBOIS

Professor of Medicine, Cornell University Medical College; Medical Director of the Russell Sage Institute of Pathology.

A few months ago I was asked to serve on a committee for revising the dietaries of a group of hospitals. We were faced with the limitations of a relatively small budget, a limited number of dietitians, and a large number of patients. The collection of special diets used in these different hospitals was quite formidable, but we found, somewhat to our surprise, that a great many of the indications could be met with a much smaller variety of diets. The urgent necessities of the situation focussed our attention on the fundamental principles underlying the prescriptions of diet in disease. With your permission, I shall treat this as a meeting of a somewhat larger committee whose chief purpose is to consider these principles. For purposes of discussion, we shall confine ourselves largely to hospital dietaries but everything that we say may be applied also to private practice. Some of you may be disappointed because I cannot tell you certain combinations of food that are ideal for certain diseases. I should like to be able to do this but it is difficult to predict how long any foods would be the proper ones. Fashions in diet change rapidly —fundamental principles remain valid for many decades.

Delivered January 16, 1931, in the Friday Afternoon Lecture Series of The New York Academy of Medicine.

At the very start, we should consider the nature of the evidence and the strictness of the criteria that must be employed in making our judgments. Our customs regarding foods become fixed so rapidly and so firmly that it seems almost impossible to apply to them scientific methods. We are accustomed to three meals a day at certain recognized hours. The number of the meals and the hours are largely determined by chance, and, as every traveller knows, the number of meals and the hours vary widely in different civilized countries; even in the same country they have varied in succeeding generations. Primitive man probably got along very well with wide variations in his meal hours. Different races get along very well with enormous differences in food materials. Doctors who specialize in diabetes have been satisfied, at various times during the last two decades, with régimes that differ quite radically. Judging by our experience in diabetic and in infant feeding, we must recognize the fact that a diet universally accepted one year may be almost entirely abandoned in half a decade.

Where do we get our information regarding foods? A small portion of it comes directly from recognized authorities on nutrition—the largest portion of it from advertising agencies who have either broadcast this information accurately or in a form distorted to suit their purposes, or, indeed, they have made up their own misinformation in order to boost the sale of their products. I do not believe that the public has realized the cleverness of the modern food advertising agency. The men who write advertisements are very highly paid, they are extremely intelligent, and they have at their command every available source of information. They can spend months in the preparation of one short sentence which serves as a slogan, and in this they are encouraged by some of our greatest universities. There is no question regarding the efficiency of these advertisements, but as to their sincerity, we sometimes have grave doubts. If then the American public is to derive its information from advertisements, it is the bounden duty of the medical profession to employ

its powerful influence in directing this advertising. It was for this reason that about a year ago the Council on Pharmacy and Chemistry of the American Medical Association established a Committee on Foods. You are familiar with the work of the Council in its censoring with great care the advertisements of drugs and medicinal foods accepted for the book "New and Non-Official Remedies." The United States Government has accomplished a tremendous amount of good by establishing and maintaining standards with regard to foods and by insisting that the label shall contain an honest statement of the contents of a package. Unfortunately, the Government has not been able to control the advertising and some manufacturers have taken advantage of this freedom. Our Food Committee, therefore, has directed its attention almost exclusively to advertising. If a manufacturer wishes to have his food product accepted for an advertisement in the *Journal of the American Medical Association,* or in *Hygeia* and to have it included by the Committee in its forthcoming book on foods, he must submit a full statement of the composition of the food and its method of preparation, and must also present every scrap of his advertising. Claims are carefully examined by a referee and are then passed on by the Committee. The result is that foods with honest advertising are accepted promptly and are allowed to be stamped with the seal of the Food Committee. Promoters of foods heralded with nutritional or health claims that are doubted are requested to give proof of the veracity of their statements, or to alter the food, or the claims, to conform to the truth. Almost invariably the producers have complied with our requests and their products have been made acceptable to the Food Committee. Sometimes such an investigation has even necessitated a complete change in the name of a product. The Committee has tried to be broad-minded and lenient and has allowed certain statements such as "The most delicious food you have ever tasted." This epithet is harmless because it is so generally applied, and it probably does make the food taste better. On the other hand, the state-

ment "An ideal food" has been rigorously excluded, and all claims to high nutritive value or a high vitamin content have been held up until proper proof could be furnished. Claims of usefulness in particular diseases have undergone the most careful scrutiny. The Committee has probably made a good many minor mistakes, but the result is that you can believe the statements made in the food advertisements of the *Journal of the American Medical Association,* or in any of the advertising matter that bears the seal of the Committee.

Now if this can be done in the case of individual foods, why cannot we here at this meeting use the same standards for various diets employed in disease? I have already mentioned the fact that innumerable diets are used in different diseases. If you look on stack S 21 of the Academy Library you will find about fifty feet of shelf room devoted to books on diet. A few inches of space suffice to contain the books that deal with the general principles, while many feet are required to hold the lists of foods supposed to benefit certain maladies. How the authors make their fine distinctions remains a mystery. One firm advertises a hundred different lists designed to accommodate any disease known to man. Another book, and not a bad book at that, lists all sorts of diets. For example, on page 194 is found "Nutritious diet (for adult male stock broker under nerve strain)." Page 86, "Gastritis, chronic, alcoholic (travelling man)." Page 81, "Fattening diet (for frail young mother)." And the next diet, also a fattening diet, is intended for "Spinster with impaired digestion." I searched for the difference between the diet for the spinster and the frail young mother and found that they were identical except that the young mother is given, on retiring, "a glass of milk, three or four lady fingers, or bread and butter." Undoubtedly the most popular diet in the book is to be found on page 207, under "Obesity." "The object of this diet is to retain the figure of youth in an unoccupied woman past forty."

Let us consider critically certain factors that go to make

up a diet. First, we have the caloric content. How closely can we estimate this? Should we say that a given patient needs enough calories to cover his basal metabolism plus 5-10 per cent for the specific dynamic action of his food plus 20-100 per cent for his bodily activity? There is a great deal of guessing called for, and it is only the man who guesses well who will come any where near the correct answer. The estimation of the basal metabolism contains an error of 10 or 20 per cent, but this is dwarfed by the estimation of the allowance for bodily activity. There are large individual variations. In general, the figures given in the text-books for people of various sedentary occupations would probably apply to most of our ambulatory patients as satisfactorily as calculations built up from the basal. The question next arises as to the smallest differences in caloric values that can be appreciated by the patient's metabolism. I doubt if a change of less than 10 per cent is perceptible except in a very delicately balanced metabolism experiment. A patient receiving say 2,000 calories would probably not react to changes much smaller than 200 calories. In other words, if we were planning a diet we could make a jump from 2,000 to 2,200 without bothering about the intermediate steps. I heard the other day of a man who wrote a book on dietetics making his increases five calories at a jump. This reminds one of the little boy who asked if it would harm the elephant if he gave him a currant from his bun.

I do not see any reason why we should not make jumps of 10 or even 20 per cent in our protein ration. For amounts of protein of over 70 grams a day it is doubtful if increases of less than 20 grams at a step are perceptible in their effects. If, in our metabolism ward, we have a patient in very delicate nitrogen balance on a low protein intake and follow him for months at a time we can discern a few minor changes in his metabolism caused by changing his protein intake 10 grams a day. Just what the optimum protein intake is for any special disease remains very much in doubt. There is no point in restricting the protein intake below 30 grams a day even in the most severe

nephritis, because if the patient doesn't get this protein from his food he will get it from his body, and the effect on the metabolism and excretory organs will be just the same. There are some indications in nephritis with nitrogen retention, and in severe diabetes, for keeping the protein intake between 30 and 50 grams for a restricted period of time. For most diseases we do not really know where to set the protein intake, except that it probably should be somewhere between 50 and 150 grams a day. For growing children and for convalescents, and perhaps for certain patients with nephrosis, intakes higher than 120 grams may be indicated. We, probably, have been too much afraid of protein food and it is certain that a good many people tolerate liberal protein rations surprisingly well.

It is doubtful if our steps in the carbohydrate ration need ever be smaller than 10 grams at a time. Perhaps in a very carefully balanced diabetic patient observed in the metabolism ward with extreme care we can see some metabolic effect from the addition or subtraction of 10 grams of carbohydrate, but in the ordinary patient about 20 grams must be added before the effect is apparent. I wish we knew the minimum carbohydrate intake that is compatible with perfect health. Joslin and some of the other workers in diabetes are much concerned with the possible danger of producing arteriosclerosis by giving, for long periods, diets that contain less than 100 grams of carbohydrate a day. This may be important, but I am not acquainted with any adequate proof of the contention. We must remember that there are tribes of Esquimos that live long and contented lives on a meat diet with a total carbohydrate intake of 30 or 40 grams a day. There is no evidence that they suffer from arteriosclerosis or kidney disease any more than the rest of us. Certain it is that arteriosclerosis is common and of major significance among the poor of our city whose diet is particularly high in carbohydrate. I am rather surprised that no one has advanced the argument that a high carbohydrate diet predisposes to arteriosclerosis.

When it comes to fat, this substance is so inert and so easily deposited in the body, or lost from the body, that we have been able, in our metabolism experiments, to change the fat intake 100 or even 200 grams at a jump without any perceptible change in the metabolism. Of course, an excess of fat long continued may lead to a higher fat metabolism and eventually obesity, while a deficit if not supplied by calories from other sources will result in undernutrition. My point, however, is that the human body can store large amounts of fat and expend them when necessary. We may use as an example the water supply of a modern city like New York. The city's consumption of water is not increased after each heavy rain, nor is it diminished in periods of drought until the reservoirs are seriously depleted. All of which leads us to the conclusion that there is no need of fussing about small changes in the patient's dietary.

The question of the mineral salts in our dietary has recently assumed a good deal of importance. Sodium chloride has been blamed, not only for the production of edema in cardiac and renal diseases, but has also been accused of contributing materially to hypertension. At first, attention was focussed almost exclusively on the chlorine portion of the sodium chloride molecule, and a diet low in table salt is often referred to as "a chloride poor diet." This has fixed in the minds of the medical public dangers attributed to chlorine. More recently, biologists and physiologists have been putting the blame on the sodium content of table salt, and it must be confessed that their evidence is fairly strong. Clinicians on the whole have been rather disappointed by the effects of salt reduction on the edema of cardiac and renal disease. Occasionally withdrawal of salt relieves an edema, but much more striking effects are often obtained with calcium chloride, especially if supplemented by salyrgan. It is, however, necessary to issue a note of warning, because the general condition of a patient does not necessarily improve in proportion to the disappearance of the edema.

The question of the rôle of table salt in the causation of hypertension is still unsettled. Allen is quite emphatic that hypertensive patients are benefitted by salt reduction, and he ascribes the failures of others to the fact that their diets have not been strict enough and have not been continued for sufficiently long periods. In Germany, a salt poor diet in tuberculosis has been urged as a method of decreasing the water content of the tissues and as an aid to calcification. Salt withdrawal is a part of the Gerson-Hermannsdorfer Sauerbruch régime. There has been a large amount of clinical observation on this subject but most of it has been rather loosely controlled and the question is not yet settled.

From the fruit-growing state of California comes an appeal for an alkaline ash diet as a cure for hypertension and many of the other ills of life. Most of us are getting along with urine that is distinctly acid on account of the preponderance of cereals and meat in our diet. If we would only change to a diet with little meat and cereal and a large proportion of beans and citrous fruits we would have alkaline urine. Oranges, lemons and grapefruit may taste acid but the citric acid is burned, leaving the basic salts to neutralize other acids in our bodies. From Germany, however, comes a plea for an acidification of the diet if we wish to cure tuberculosis. There is a great deal of talk but very little evidence. At the present time we should be careful not to be carried away by propaganda.

Calcium is deservedly coming in for a great deal of attention. Sherman has shown that the American diet is dangerously near the minimal calcium intake theoretically compatible with health. The discovery of parathormone and viosterol has given us means of modifying the calcium metabolism. In certain definite diseases of calcium metabolism the clinical results have been striking. These two products sometimes need to be supplemented by a diet rich in calcium and for this indication milk has shown its value. Calcium lactate is being used extensively and good results

have been obtained with calcium gluconate. When it comes to the question of the diet for diseases not definitely associated with the disturbance of the calcium metabolism, we are still without evidence as to the optimal calcium intake.

This naturally brings us to a discussion of the vitamins. There is no question at all as to the value of the vitamins in cases of well-established vitamin deficiencies. In patients who have definite symptoms of these deficiencies, the results of feeding the proper vitamin are almost miraculous. Here, in New York, frank cases of vitamin deficiency are comparatively rare. Even at Bellevue Hospital where we treat the poorest classes of the city, and care for many sailors, many foreigners ill-adapted to our New York life, many down-and-outers who are either densely ignorant or mentally subnormal, and many chronic alcoholics, we have relatively few clear-cut cases. I, myself, have never seen xerophthalmia, or beri-beri. We often go months without finding an adult case of scurvy. Osteomalacia is extremely rare. Pellagra in its more severe manifestations is uncommon, in New York, but we do observe among chronic alcoholics quite a few men with the milder symptoms. These patients usually give a history of having subsisted for many weeks on a diet of coffee and doughnuts.

What about the effects of vitamins in patients who do not show the frank symptoms of deficiency? Should we deliberately strive in the case of healthy persons and with most of our patients to provide a diet containing a much larger amount of vitamins than has been the custom here in New York? It is very hard to obtain direct evidence on this point. The poor of this city probably take in their diets a small fraction of the amount of vitamins consumed by the rich. They seem to be somewhat more susceptible to disease, but not markedly so, and it is only when we get down to the lowest levels of poverty, shiftlessness, alcoholic indulgence, and exposure that we find a sharp increase in the mortality in such diseases as lobar pneumonia and tuberculosis. We must remember, however, that many factors besides vitamins affect this situation.

The Mellanbys believe that there are substances in some foods, such as oatmeal, that act in a manner opposed to the vitamins, and they believe also that an excess of vitamins will increase resistance to infection and prevent decay of the teeth. There is a good deal of evidence that a diet rich in a variety of vitamins, particularly A, C, and D, will increase resistance to tuberculosis and help in the prevention or cure of intestinal lesions of this disease. There are many reports indicating augmented protection against minor infections. The widespread popular movement towards a more liberal vitamin ration is most cheerfully aided and abetted by the manufacturers of every foodstuff containing more than a trace of vitamin. Probably we should allow ourselves to be carried a moderate distance by this wave of popularity. A diet high in vitamins is apt to taste good, seems to improve the appetite, and usually carries with it an increase in the mineral salts. There is only small evidence that such a diet can do harm. Very large doses of vitamin D, as contained in high-potency viosterol, are dangerous, and it is quite possible that any large amounts of one vitamin unbalanced by others may produce untoward effects.

When it comes to the practical administration of the vitamins, we must remember that they vary greatly in their responses to cooking, drying, and storage. Vitamin A, the fat-soluble vitamin which cures xerophthalmia and aids in growth, is fairly stable to heat and is only slightly affected by cooking or by canning, if air is excluded in the process. Vitamin D is very resistant, as is vitamin B_2, sometimes called vitamin G, the one that is associated with the prevention and cure of pellagra. Vitamin B_1, sometimes called F, or the antineuritic vitamin, is partially destroyed by heating to a high temperature in the presence of alkali; vitamin C, the antiscorbutic vitamin, is rapidly destroyed by cooking in an alkaline or even in a neutral solution, and is also susceptible to drying or aging. Fortunately, one of the best sources of this vitamin, tomato juice, is not spoiled by careful cooking, or canning, because it is acid.

There has been a widespread prejudice in this country against canned vegetables, and a great many people still believe that the so-called "fresh vegetables" cooked in the home contain more vitamins than canned foods. This is probably not the case, as the home-cooking of vegetables, or fruits, in an open vessel is an excellent method of oxidizing the vitamins, particularly if cooking soda is added to preserve the green color and improve the flavor. Most of the canners are now taking every precaution to avoid the oxidation of the vitamins. Fruits and vegetables are prepared when they are very fresh, and if they are to be puréed they are hashed in an atmosphere from which oxygen has been excluded and cooked in one that is practically oxygen-free. In all products submitted to the Committee on Foods, tests on animals are made which show as quantitatively as is possible at the present day the content of the vitamins.

The importance of roughage in the diet has been the subject of a good deal of controversy. In Germany, there has been great enthusiasm for a raw diet which is high in vitamin content and high also in indigestible residue. Some of the reports say that it is borne surprisingly well, but most of the German physicians seem to look on it with mild amusement. Again, in California, there is some tendency toward a diet with a very bulky residue. Alvarez, of the Mayo Clinic, believes that an excessive amount of roughage can do a great deal of harm, and has obtained with a bland non-residue diet results that would delight the strongest advocate of bulky residues. Bran has had a tremendous vogue among the laity, encouraged by the advertising of manufacturers of bran products. Recently, I canvassed the best gastroenterologists that I know for their opinions and found that none of them advised the use of bran, although they did not seem to think that small amounts were particularly harmful. The excessive quantities of bran and other roughage consumed by some individuals with a frantic desire to cure constipation may do a great deal of damage. Man was not given the digestive system of the ox.

We have just reviewed a large number of debatable points in the dietary of disease. How can we secure reliable evidence as to whether or not a certain diet is of benefit? Clinical impression is the popular answer, and it would seem fairly satisfactory were it not for the fact that clinical impression, in past decades, has strongly backed about one thousand drugs or diets now discarded, for every dozen drugs or diets now employed. There is no good reason why a diet that is worth while should not give results that are definite enough to become apparent when treated in a perfectly scientific manner and subjected to analysis. Suppose, for example, we wish to prove that a certain diet in lobar pneumonia is better than the conventional one used in this disease. The first thing to do would be to assign alternately our pneumonia cases to two groups, one receiving the new diet, the other, the old. Care would have to be exercised in order that each group should contain approximately the same proportion of pneumonias of the severer types, etc. Judging from my past experiences in testing serum and digitalis in lobar pneumonia, I should say that we would probably have to collect at least four hundred cases on the new and four hundred on the old before we could say definitely that the new diet produced a lower mortality than its predecessor. If the results were very striking and one group showed a mortality of 40 per cent, while the other group showed a mortality of 30 per cent, we could perhaps obtain our answer before we had studied 800 cases. Of course, a much smaller number of cases carefully studied would give us information regarding the effect on abdominal distention, nitrogen balance, etc. In the case of typhoid fever, Coleman was able to establish the beneficial effects of his diet fairly definitely by an analysis of 111 cases on a high calory diet, as opposed to about 773 controls on a previous low calory régime. I had the good fortune to be associated with Dr. Coleman in part of this work, and I know the careful studies that supported the relatively small number of cases from which the final conclusions were drawn. Shaffer and Coleman spent several years in a study of the nitrogen balances. I, myself,

spent about two years in a study of the absorption of the food in his cases. Dr. Coleman and I studied the caloric requirements and the effects of food on metabolism, first, for two years with a small respiration apparatus, and then for two more years, in a respiration calorimeter. Torrey made an extensive investigation of the bacterial flora. Finally, the experiences of many other clinics confirmed Coleman's conclusion. None of this work was wasted—it was all necessary to prove the point.

Let us contrast with this prolonged study the methods that have been used in forwarding the Gerson-Hermannsdorfer-Sauerbruch diet in tuberculosis. This diet, first devised by Gerson, is high in vitamins, sodium chloride is excluded as much as possible, and a mixture called mineralogen is included, consisting of a dozen salts, the main constituents being calcium phosphate and calcium lactate, supplemented by other compounds, one of which is a substitute for salt, the other probably contains cod liver oil and phosphorus. This diet has been given to a large number of tuberculosis patients; some clinicians are very enthusiastic about its effects in lupus, and others say that it is of great help in bone tuberculosis and in the healing of wounds. In certain quarters its results in pulmonary tuberculosis are highly praised, but a good many writers insist that this régime possesses no advantage over the customary diet which contains liberal amounts of vitamins. What would be required to put this régime to a really scientific test? I believe that it would be necessary to select two hundred patients with tuberculosis, and, as controls, an equal number with approximately the same localization and severity of infection. These two groups should be followed for one or two years before drawing any conclusions. If by that time the régime showed a significant advance in therapy, it would be essential to test out the various factors, one at a time, in order to know whether it was a high vitamin content, or a low sodium chloride, or a complicated mixture of salts that was responsible for the improvement.

I suppose it is too much to hope that diets for diabetes will be tested in this manner. In the last eighteen years I have watched many diabetic diets come and go and each time that a new one has become fairly well-established I have wondered how long it would last. During this period, we have had the Naunyn diet, the Allen treatment, the Shaffer-Woodyatt balanced diet, the Newburgh and Marsh high-fat diet, the insulin régime with increasing carbohydrate, and now we have reached an era when the carbohydrate is being raised still higher in our effort to make the patient happier and to prevent the possible development of arteriosclerosis. There is much to be said in favor of giving liberal amounts of carbohydrate if the insulin is carefully regulated, but this diet is not an easy one for the doctor, and its use requires a great deal of skill. In fact, every diabetic diet requires skill and a fairly extensive knowledge of the fundamental principles of metabolism. I think we should remember that the basis of an excessively high carbohydrate diet for patients who require insulin is largely theoretical, and that it is going to be many years before statistics will show whether or not we have diminished the incidence and severity of arteriosclerosis by this treatment. Personally, I am more inclined towards a moderate carbohydrate intake and smaller doses of insulin. Still, there are a great many things that we do not know about carbohydrate metabolism. There is a good deal to show that if the carbohydrate intake is restricted too much the patient loses tolerance, and that carefully adjusted increases in the carbohydrate ration may lead to an increased ability to oxidize this foodstuff. For many years we strove to protect this oxidative function by keeping the demands upon it as low as possible. Now we strive to exercise it judiciously but in our enthusiasm for the new method we must be careful not to overstrain this function. Experience has shown that when a diabetic indulges in carbohydrate excesses he pays the penalty with diminished tolerance and perhaps even with coma.

I wish that it were in my power to state exactly the

best diet to be used in obesity. All we know is that if you want to reduce the weight of a patient you must see that the caloric intake is distinctly less than the caloric output. If this is kept up for over a month and the patient does not happen to develop an edema, there is no way that he can escape losing weight unless he finds some supernatural means of violating the law of conservation of energy. It is curious how many doctors adopt theories regarding obesity that violate this fundamental law, when their sole evidence against it consists in statements from their patients to the effect that they are not large eaters. Newburgh and Johnston have recently published reports of careful studies which show that obese patients who are carefully watched and given sub-maintainance diets always lose weight, although such loss may be masked for one or two weeks by a retention of water in the body. This finding is by no means new, but these workers have demonstrated it most convincingly. They have emphasized the old belief that obesity is caused by too much food in relation to the expenditure of energy and they disregard the various complicated classifications of obesity that have confused our literature. All clinicians agree that there is a form due to over-eating, but they also set apart groups of patients in which the trouble is supposed to lie in one or more of the ductless glands. It is in these groups that they seek for supernatural mechanisms. It may be true that in a given patient with hypothyroidism, or dyspituitarism, the basal metabolism may be lower than normal and there may perhaps even be a greater economy in the digestion of food and the performance of muscular tasks. In such a patient the total expenditure may be low, but if the intake is still lower a loss of weight is inevitable. There has been an extensive search for the mysterious factors that border on the supernatural. A good many European and some American investigators have reported that the specific dynamic action of foods is reduced in obesity. McClellan and Spencer, in our laboratory, and a good many workers in other laboratories have been unable to confirm this fact. I do not think that any significant abnormality

has been found in the metabolism in obesity except an increased ability to metabolize fat without ketosis. Obese patients have an unusual tolerance for a low carbohydrate diet. Although they tolerate a low carbohydrate diet this does not necessarily mean that such a diet is indicated. In our reducing diets we should provide enough protein to maintain a patient in nitrogen equilibrium, which can probably be accomplished by almost any amount over 60 grams a day. I do not know of any convincing evidence as to whether we should provide the remaining calories chiefly in fat or chiefly in carbohydrate, so perhaps it is just as well to leave this to the individual doctor who will quickly enough form a strong prejudice for one or the other.

It is impossible in this brief talk to mention more than a few of the diets used in the clinic. There is, however, one point of fundamental importance that I should like to emphasize and that is the time factor. If a diet is planned for a long period, it is essential that it should contain all the calories and individual elements necessary for adequate nutrition, unless we are deliberately attempting to reduce weight by restricting calories. If a diet is to be used for only a few weeks, as, for example, the strict Sippy diet in peptic ulcer, we can relax our vigilance regarding the various constituents, even some of the vitamins. Healthy men can starve for a month if given plenty of water. Patients with fever and toxemia do not tolerate starvation nearly as well, but, nevertheless, they can draw on their bodies for many pounds of fat and of protein and for considerable amounts of calcium and other salts. A man who has been well fed can begin his starvation with a reservoir of about a pound of carbohydrate and several liters of water. Now these reservoirs are relatively small and they are the ones on which the clinician should concentrate his attention.

In a short and stormy illness where complete loss of appetite, or nausea, has limited the food intake, we do not need to worry much about the protein and the fat but we

must remember that it only takes two or three days to exhaust almost completely the small glycogen stores of the body and also the small reservoirs of water. Acute illness is usually accompanied by high metabolism which uses up carbohydrate rapidly. Fever and high metabolism lead to excessive losses of water through skin and lungs. If at the same time the fluid intake is diminished there will be a serious dehydration of the tissues, especially if there has been vomiting, diarrhea, or diuresis. I do not think it is too much to say that the dietetic error that has killed more patients than any other is the neglect of administering enough water. If water cannot be given by mouth, it must be given by rectum, by vein, or by the subcutaneous method. The practitioner should remember two things, first, that patients lose more than 600 grams of water a day through skin and lungs, and, second, that most people ingest about half of their water in the form of their so-called "solid foods," particularly such foods as lettuce, tomatoes, fruits, potatoes, etc. When these solid foods are cut off in disease it is necessary to supply a proportional increase in the liquid foods in order to bring the water intake up to the level of that of the ordinary man in health. In acute disease, we should make a still further increase in order to compensate for the excessive loss of water through skin and lungs. I beg the practitioner who is taking care of a patient severely ill to watch the urine and see that it does not become too concentrated. A high colored urine is a reproach to the doctor and to the nurse. A dehydrated skin and tongue are danger signals.

When you try to feed patients who are acutely ill, the limiting factor is usually lack of appetite. How I have longed for some hormone that would bring the appetite just to the desired level, so that the patient would take gladly the food that is offered to him. We should not be too placid in our acceptance of this lack of appetite. Often when a nurse has told me that a new patient, say with typhoid fever, has no appetite, I have found the tongue dry and cracked and the teeth covered with sordes. How could any man have an appetite with a mouth of that sort?

Why is his mouth in that condition? Often it is dry because he is breathing through it, and he is breathing through it because his nose is stopped with dried mucus. Therefore, if you want to combat in a typhoid patient the phenomena of a low respiratory quotient, ketosis, negative nitrogen balance, etc., you should start with the simple operation of clearing out the nose so that the patient can breathe through it. You should next clean his mouth as rapidly as it can be done without undue trauma. You should then bring back the appetite by forcing food until the patient gets sufficient strength to have some appetite of his own. In the course of a few days you will often be surprised to find that a patient in the midst of his typhoid fever, will have teeth and tongue as clear as your own.

If we only had the proper hormones to control appetite how easy would be our task. We could bring the undernourished man up to the ideal weight; we could give the diabetic the proper combination so that he would not desire to steal sweets; we could give the glutton an antihormone so that he would no longer want to eat too much. Let us look forward to the day when we can turn to the office nurse and say, "Give this patient a 1500-calory appetite."

In conclusion, I would like to speculate on the possibilities of dieto-therapy. Many enthusiasts believe that proper diets will cure practically all our ills, except a few that require surgery. I hate to be pessimistic but I cannot believe that diet will ever become of very much more importance than it is at the present time. The enthusiast points to the recent advances made through diet in the treament of diseases of vitamin deficiencies and of pernicious anemia. Far be it from me to belittle the importance of these discoveries, but are they really dietary? The biochemists, with the aid of the large drug houses, have taken these food-stuffs and concentrated them until the active principles are now contained in pills. Shall we call liver extract a drug or a food? No one at the present time

considers thyroid extract a food, but a man who called himself a "dieto-therapeutist" might administer to his myxedema patient a hash containing thyroid extract; he could treat his patients having constipation with a stew made of senna leaves and figs, and malaria with a bitter tea made from cinchona bark. So, after all, it does not make much difference what we call these various agents, as long as we recognize their true natures and utilize them intelligently.

Not only must we recognize the true natures of the agents but we must also recognize their limitations. We must scrutinize with care all of our evidence. We must differentiate clearly between traditions founded on impressions and facts based on scientific observations. In each individual patient we must visualize the various metabolic processes and must direct our therapeusis to meet these specific indications.

COMMITTEE ON PUBLIC HEALTH RELATIONS

Address, E. H. L. Corwin

Address of Dr. E. H. L. Corwin at the dinner given in his honor by The New York Academy of Medicine on the evening of May 6, 1931, to commemorate his twentieth anniversary of service with the Academy.

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While I know better than anyone else in this assembly that what has been said about me this evening is very generous, I may as well throw away false modesty and frankly own that it has given me infinite pleasure—for we are so constituted that we like to be praised at times, and we are thereby stimulated to greater endeavors—particularly when praise comes from such men as Dr. Hartwell, Dr. Dana, and Dr. Miller, under whose wise guidance it has been my privilege to serve the Academy. I cannot help but be proud that amidst the many and varied interests and obligations which all of you here assembled have, you have chosen to come here this evening to do me the honor, at this first historical occasion of mine.

When one begins to have historical events like this one, marking decades of service—when one has taken the first step to the emeritus rank, one is bound to indulge in reflections of a serious character, particularly when one has "history" as a mild avocation, as happens to be the case with me. I often reflect as to what it is that has always attracted me to the past. It is, I suppose, my attachment to humanity, my interest in the struggles of mankind, and in the glory of man's achievement in the face of his limitations. Then, in retrospect, the characters of the drama of history are, in the words of Preedy, often "gorgeous ghosts; they enact their parts splendidly, their passions are romantic, their actions seldom lack the heroic outline; since they

died their persons have taken on a richer beauty, their characters a nobler cast; they are grander than when they lived; so much may we allow them in recompense for the dust that covers their memories." As the deeds that I will relate tonight do not lie that far in the glamor of the distant past, I will open my tale with a reference to real antiquity.

It was two thousand and three hundred years ago that on a sultry summer day, three men sauntered on the road from Cnossus to the cavern and temple of Jupiter. As was suited to their age, they rested frequently in the shade of the lofty trees of the road, as they discussed the origin of the State, the forms of government, and the bases of law. The three men were Clinias, of Crete, the host; Megillus of Lacedæmon, and Plato of Athens, his guests. The penetrating wisdom and worldliness of this symposium, known as "The Laws" of Plato, make it the greatest political treatise of history. I will quote but one bit from this conversation:

Athenian: "I was about to say, that no man is ever a legislator; but that fortune and all kinds of accidents, happening in all kinds of ways, are our legislators. For either a war by violence has overturned polities and changed laws, or the want of means arising from severe poverty. Many innovations, too, diseases compel men to make, through pestilences falling upon them, and unfavourable seasons during many years. He then, who foresees all this, will be eager to exclaim, as I just now did, that no mortal was ever a legislator, but that nearly all human affairs are accidents; and that it is possible for him, who asserts all this respecting navigation, and the arts of the pilot, and physician, and general, to appear to speak correctly. But on the other hand, it is equally possible for the person (to appear) to speak correctly on these points, who says this."

Clinias: "What?"

Athenian: "That a god, and, together with a god, fortune and opportunity govern all human affairs; but that it

is necessary to admit that art, a somewhat milder power, follows them. For on the occasion of a storm I should consider it a thing of great moment for the pilot's art to take a part, or not."

Accident and *opportunity!* They are often, indeed, determining factors in human affairs, individual and corporate. I shall no more than mention the *accidental* determination of my own life's work, and will proceed to present to you, very briefly, the results of the vision the men of the Public Health Relations Committee had, to use an *opportunity* to make the New York Academy of Medicine a vital force and a tower of strength within the gates of our City, and an object of emulation without.

I remember very distinctly the first meeting of the Committee which took place one evening in May, 1911, at the City Club. There were present: Dr. Dana, Dr. Miller, Dr. John Winters Brannan, Dr. Robert J. Carlisle, Dr. S. S. Goldwater, and Dr. Linsly R. Williams, and the following nine who are no more with us: Dr. Hermann M. Biggs, Dr. Algernon T. Bristow, Dr. Arpad G. Gerster, Dr. L. Emmett Holt, Dr. John H. Huddleston, Dr. Abraham Jacobi, Dr. Theodore C. Janeway, Dr. Samuel Lloyd, and Dr. W. Gilman Thompson. After the preliminary half hour of inchoate discussion, a subcommittee on plan and scope was appointed. This subcommittee, under the chairmanship of Dr. Miller, drew up a brief but statesmanlike report which became our charter.

The work began in a classical way. We were to study the incidence of epidemic diseases and the organization and administration of the contagious disease hospitals of the City. The available data of morbidity and mortality from zymotic diseases since the consolidation of the Greater City, showed the, by now well established, periodicity of certain of the diseases and brought out the fact that diphtheria has been an endemic rather than an epidemic disease. The study of the hospitals revealed the very striking shortcomings of these institutions at that time and the

shockingly high rate of cross infections. This marked a beginning of a slow process of improvements in these hospitals which came to full fruition a few years ago in the entire re-organization of the system, when Dr. Wynne was the Director of the Division of Hospitals in the Health Department, and the late Dr. Arthur W. Bingham was President of the Medical Board of Willard Parker Hospital.

The data gathered in this investigation were discussed by the newly-appointed Executive Committee which met every week. To my distress, it has been meeting every Monday afternoon ever since!

After a very short time of its existence, the Committee not only dispelled such apprehensions as the Trustees and Council of the Academy might have had as to the possible rashness of its decisions and pronouncements, but was able to secure from the Council and Trustees a Magna Carta of complete autonomy. In order not to hamper the Committee in its work the Council amended the by-laws of the Academy, which amendment was subsequently ratified on two occasions by the vote of the whole Academy, by which the Committee, in matters of public health and hospitals, might speak in the name of the Academy when a given action is adopted by a three-fourths vote of its membership, and the President of the Academy concurs. This was a very important and helpful provision, and to oil the machinery still further, we always had the President of the Academy as a member of the Committee ex officio. I may add that every one of them was an apt pupil: Dr. William M. Polk, Dr. Walter B. James, Dr. George David Stewart, Dr. Samuel A. Brown, Dr. Samuel W. Lambert, and Dr. John A. Hartwell. The last three presidents, prior to their election to the office, had the benefit of a preliminary service on the Committee. I wonder whether the precedent has not by now been firmly established. And yet we claim that we have nothing to do with politics! We must own, however, that at times we have employed the arts of diplomacy, although never its wiles.

Whenever one deals with "relations," whether congenital or acquired, diplomacy is indispensable, and we have been a Committee on Relations—Public Health Relations!

Our achievements, whatever they be, have been due, however, to more than diplomacy and tact. They have been due to the fact that the men on the Committee have been practical idealists, earnest in their solicitude for the welfare of our common life, imbued with the lofty traditions of their profession, and ready at all times to study minutely each matter on which they were to act or about which they were to express an opinion. The Committee was most fortunate in having had for its pilots men of such keen intellect, civic spirit, and high professional and cultural ideals as Dr. Dana and Dr. Miller. To have been associated with such men has been a privilege and inspiration of which I am acutely aware. Nothing has given me greater satisfaction than the fact that I have gained their friendship and appreciation.

Our work has been so diversified and has touched on so many domains of our civic, scientific, and educational life, that I have come, on account of it, into contact with men and women of all walks in life, who are the leading citizens of our community and of the nation. Many of them are here tonight, and I take this occasion to thank them and all others for their highly-prized friendship, and for their ever-ready helpfulness in our work. I also wish to express my gratitude to the many Fellows of the Academy who have responded cheerfully to every request which we have made of them for service. Several hundreds of the Fellows of the Academy have, during the course of the past two decades, served on our various subcommittees, and have given us the benefit of their judgment and their specialized knowledge. The strength of our position lies in the readiness of the entire Fellowship to serve for the benefit of our commonwealth and for the greater glory of the Academy.

Following the traditions of the original Academy of Plato, and of all the great academies of the world, our

Academy is primarily a deliberative, and not an executive body. But we have been able, however, as a result of our deliberations and surveys, to initiate a number of executive organizations, to stimulate new activities, and to influence the course of many already established.

As early as 1912, an Association of Out Patient Clinics of the City of New York came into existence, thanks to our initiative. The Committees of this Association formulated the first existing standards of dispensary organization and administration, and these were subsequently adopted by the American Hospital Association and by other national bodies. Following our survey of dispensary performance, the Rockefeller Foundation set up a Committee on Dispensary Development to stimulate the practical adoption of these standards. The Associated Out Patient Clinics continues its useful existence as a part of the New York Tuberculosis and Health Association, under the guidance of Dr. Alexander Lambert.

In 1915, we inspired the formation of a Health Federation in New York City which did useful work in the City, under the chairmanship of Dr. Livingston Farrand, until our entrance into war.

Jointly with the Bureau of Municipal Research, we organized the first practical six-week course in Public Health Administration, which was attended by fifty-five health officials from many parts of the country.

Our study of the *Hospital Situation in Greater New York* was admittedly a model for future surveys in other cities. Following the publication of it, the Hospital Information and Service Bureau came into existence as a result of a morganatic marriage of the Academy with the United Hospital Fund. This Bureau has functioned as a very useful institution in this City, under the chairmanship of Dr. George David Stewart.

The Public Health Relations Committee formulated standards for convalescent care which, like those of out

patient work, constitute the first attempt at formulation of principles in this important, but hitherto neglected branch of our armamentarium in the treatment of the sick. This work is developing very rapidly under the chairmanship of Dr. Adrian Lambert.

Following our study of child health, the Laura Spelman Rockefeller Memorial Fund set up an Institute for Child Study in connection with Teachers' College.

Our inquiry into conditions surrounding the supply of blood donors for transfusions led to the organization and incorporation of the Blood Transfusion Betterment Association, which functions very effectively under the presidency of Dr. John A. Hartwell, and under the scientific guidance of Dr. Karl Landsteiner.

Our dental school survey of many years ago prepared the way for the re-organization of the then proprietary schools as university departments of dentistry.

Outdoor cleanliness contributes to health and to civic pride. We have brought about the organization of the Committee of Twenty on Outdoor Cleanliness, on which many civic agencies are represented, and which, with the aid of sanitary experts like Dr. George Soper and Mr. Thomas J. Duffield, carries on very good work under the vigorous chairmanship of our Dr. Bernard Sachs.

Under the chairmanship of Dr. Conrad Berens, we have recently completed a most painstaking survey of air pollution, and we are hopeful that in the near future the smoke, soot, and vapor pall hanging over our City will be dispelled, and that we will reclaim the full quota of our ultraviolet radiation for which our City was renowned in the pre-prohibition days. Somehow or other, everything has gone wrong since the advent of this era.

We are now in the course of conducting a most searching quest into conditions of obstetrical practice in this City. This study, conducted by Dr. Ransom Hooker, with the aid of a group of eminent obstetricians, and under the direc-

tion of a subcommittee of which Dr. Sondern is chairman, bids fair to result in a better understanding of existing conditions than has ever been arrived at elsewhere, and will, no doubt, lead to some effective measures of control.

We have brought about the organization of the National Conference on Nomenclature which, thanks to the indefatigable industry and the remarkable ingenuity of Dr. George Baehr, the Chairman of the Executive Committee, and Dr. H. Burton Logie, its Executive Secretary, has accomplished what seemed to be an impossible task.

We have repeatedly stressed the importance of the proper care of the sufferers from chronic ailments. Recently, prompted by the appreciation of the need for service in this neglected field of therapeutic endeavor, we made a study, under the chairmanship of Dr. Malcolm Goodridge, of the principles and management of spa treatment in France and in other countries. On the basis of this report, and thanks to the persuasive efforts of Mr. Bernard M. Baruch, the New York State Legislature voted one million dollars last year, and another million this year, for the proper development of Saratoga Springs.

Although we do not maintain a lobby at Albany, we pester the legislators at each session with many missives sent by wire or by post. Professor Joseph P. Chamberlain, the head of the Law Drafting Bureau of Columbia University, has aided us on many occasions in the study of various health measures pending in the Legislature. On several occasions we have championed successfully our own projects. Single-handedly we brought about the transfer of the maritime quarantine at the Port of New York from state to national control. Until recently, our report on *Maritime Quarantine in the United States* was the only history of quarantine in this country.

Following our inquiry into the coroner situation, the matter was taken up by the then Commissioner of Accounts, Mr. Leonard M. Wallstein, and the coroner was legislated out of existence in the five counties comprising

New York City, and has been superseded by the efficient office of Medical Examiner which, for the last twelve years, has been occupied by Dr. Charles Norris.

With our aid, the obsolete law relating to cadavers was supplanted by the present law. The new law differentiates between an *autopsy* and a *dissection,* which the old law did not; allows the removal of organs for scientific purposes, which the old law specifically forbade; and eliminates "the friend" from preventing the performance of a post mortem.

Recently we drew up a covenant with the Metropolitan Funeral Directors' Association which will, we hope, remove many grievances and misunderstandings, and which will bring about coöperation on the part of the undertakers in securing consent for necropsies. This document, prepared by a subcommittee under the chairmanship of Dr. Ward J. MacNeal, has been submitted to the Council of the Academy for their approval.

Our book on the *Outline of Preventive Medicine,* published by Paul B. Hoeber & Company in 1929, is one of the first attempts to summarize the opportunities of applying preventive principles in every branch of medicine. The Greater New York Committee on Health Examinations endorsed this text book and, through arrangement with the publisher, secured wide distribution of the book among the profession in this City.

The motto of our Committee has been: "Homo sum: humani nihil a me alienum puto"—nothing that touches human welfare is foreign to us. Either at our own initiative or at the request of the various city or state or federal departments of Health, Hospitals, Public Welfare, Education, Civil Service, Police, Prisons, Water Supply, or of the many civic agencies, we have dealt with every problem in the broad field of public health activity. Our relations with the City Departments have been most satisfactory and close coöperation has existed since the inception of the Committee's work. Annually, the budgets of the City Departments, particularly that of the Department of Health

and of the Department of Hospitals (formerly the Department of Public Welfare and Bellevue Allied) have been studied in conferences with the Commissioners, prior to the submission of the budgets to the Board of Estimate and Apportionment.

From day nurseries, malnutrition among school children, the supervision of summer camps, and special classes for the cardiopathic and the crippled, to the care of the decrepit in almshouses; from the protection of the milk and water supplies, the supervision of food handlers, the adulteration of foods and drugs, through typhoid fever inoculation, to harbor pollution and sewage disposal; from the collection and administration of poliomyelitis convalescent serum to the Calmette-Guèrin vaccine; from the control of the feeble-minded and drug addiction, to the sterilization of the unfit; from automobile accidents, tetraethyl lead, carbon monoxide poisoning, asphyxia, resuscitation, and oxygen therapy, to ventilation, open stair tenements and multiple dwellings; from chlorine treatment of colds to Coué-ism; from venereal diseases and stillbirths, through "twilight sleep" to nurse anæsthetists; from radio broadcasting to medical ethics; from the training of doctors and nurses, to marriage laws of minors; from continuation schools and industrial medicine to X-ray treatment of hypertrichosis in beauty parlors; from ringworm, through rickets, to rabies; from optometry, anti-vivisection, and chiropractors to insane asylums; from the control of proprietary and open hospitals to group practice, pay clinics, workmen's compensation, health insurance, and medical and surgical accountability; from standards of physical fitness of teachers, and the employment of teacher mothers in schools, to state censuses—I could go on almost ad infinitum. I must, however, single out one subject, and that is "birth control," because this was the only pronunciamento of ours which some of the editorials in the metropolitan daily press designated as "epoch making" and because it has a history peculiarly its own. It has been popping up every once in awhile through the course of a dozen

years or so. Although we did not mind dealing with "the population problem," we eschewed "birth control"—the name was offensive, sort of propagandistic. One day Dr. Dana recalled that "the Greeks had a word for it" and we began calling it "oligogenics." From then on the road was smooth. There is a great deal in a name, even in an Areopagus like ours.

I do not know whether there is any other organization which has the same esprit de corps as ours, where there is so much freedom of discussion and the same lack of restraint in "thinking aloud." Because of continuity of policy, concentration of effort, and cumulative experience, it has been possible for the Committee to achieve what it has.

I do not wish to indulge in vaticinations which are proverbially dangerous. I dare say, however, that in addition to the discussion and consideration of the same problems with which we have dealt heretofore, and which forever take on protean forms with changing conditions and new developments, we will be dealing more than we have done in the past, with the important economic aspects of preventive and curative medicine. I believe that we are soon to behold an epiphany of a new era, much as we may dislike it. I hope, however, that we shall always continue to take the part of the corypheus and not that of the epigonus, of the pathfinder and not of the trailer, and that we shall never feed oats to Pegasus.

Remarks, Charles L. Dana

When thinking over what I would say tonight there came to my mind an old anecdote with regard to a stranger lost on the Arabian desert. Meeting an Arab chief the stranger asked him how he could find his way through the desert and out. "Follow the tracks of the camel," said the Arab chief. "I see no tracks of a camel, only those of a man," said the stranger. "The man is carrying the camel" was the reply.

This inversion of activity seems to me to apply to the Chairman of the Public Health Committee and Dr. Corwin. I was Chairman of the Committee for eighteen years but you will find no marks of my feet in this academic sand, only the specially deep impressions of Dr. Corwin's tread.

My experience in this elevated type of transportation has been interesting and enlightening. Dr. Corwin has been an efficient administrator, and has carried on the work with wise and tactful initiative and we have had consistently and uninterruptedly agreeable social and business relations throughout these twenty years.

REPORT ON NECROPSIES

Prepared by the Joint Committee representing

THE NEW YORK ACADEMY OF MEDICINE, THE NEW YORK PATHOLOGICAL SOCIETY, AND THE METROPOLITAN FUNERAL DIRECTORS' ASSOCIATION.

The Committee met on December 23, 1930, on January 12, 1931, and on January 19, 1931. Various phases of the problem were discussed at these meetings and a substantial agreement was reached.

A. *Desirability of Necropsy.*

1. All agree that the post-mortem examination by a pathologist is desirable; first, to provide reliable recorded information concerning the cause of death and the nature of the various disease processes in the particular body; second, to confirm or amend the opinions formed by the physicians during the life of the patient so that they may serve the next patient with greater confidence and skill; third, to reveal to the physicians continually the physical changes in the interior of the body which are associated with disordered behavior during life; fourth, to provide for the advance of human knowledge concerning the nature of disease in general. It is clearly evident that the practice of post-mortem examination in a hospital exercises a constant influence to improve the service and to correct serious deficiencies, as well as to improve diagnosis and prevent disease.

B. *Coöperation of Hospital Authorities and Funeral Directors*

1. The hospital and its medical staff have not completed their service to the family upon the death of a patient. They owe to the family a further service, namely, to give an account of what has occurred, together with the most

accurate possible explanation. This requires that some representative member of the family come to the hospital for a personal interview and to give permission for the examination of the body of the deceased. The funeral director must recognize this relationship and should not oppose the proper efforts of the hospital authorities and the physicians in the discharge of this obligation.

2. The funeral director is particularly interested in getting into his own hands: (1) the death certificate, (2) the permit to remove the body, and (3) the body itself, so that he may prepare the body in a satisfactory manner for the funeral ceremony and may be certain that nothing will arise to interfere with his plan and program. Unforeseen delay may require cancellation of contracts for transportation and various other services, thus increasing the expense and causing dissatisfaction. Unreasonable delay by the hospital, in its attempt to obtain permission for necropsy, is, therefore, objectionable to the funeral director. The conflict of interests in this connection requires mutual consideration and a spirit of coöperation on the part of all concerned. Particular disputes should be considered by a permanent committee on coöperation.

3. The funeral director or his agent must present to the hospital acceptable written authority from the family of the deceased. The printed form now employed by the Metropolitan Funeral Directors should be slightly altered so that the signature of the next-of-kin will appear on the written authorization, along with the sworn statement of the funeral director to the effect that he has been properly engaged to take care of the body.

4. Hospital employees, in general, must not give information to favored funeral directors nor to any other unauthorized persons in regard to persons critically ill or dead in the hospital. It is proper for the chief administrative officer of the hospital, when requested by the family, to refer the selection of a funeral director to the office of the Metropolitan Funeral Directors' Association, or, quite

properly, to select one by rotation from an approved list in his own office. Such a selection must never be left to a minor employee of the hospital. Proof that a minor employee has offered recommendations of this sort should be followed by his instant dismissal from the service.

5. The hospital authorities should make certain that the necessary data for a death certificate, except those facts relating to the nature, progress and termination of the present illness, are recorded on the chart record at the time of admission of the patient. Such data as date of birth and maiden name of mother may be obtainable only with great difficulty after death of the patient. The death certificate may very well be filled out by a clerk using a typewriter, leaving only the diagnosis and signature to be supplied by the physician who completes the certificate.

6. Report of a death to the Medical Examiner should be made in those circumstances where this is legally required, and the decision to notify this official should be made at the time of death of the patient, entirely without regard to the attitude of the relatives concerning necropsy. It is improper for any member of the hospital staff to threaten to call the Medical Examiner if permission for necropsy is refused. Any such procedure of threatening or browbeating may be regarded as evidence of lack of ability to handle the situation.

7. In general, the permission for necropsy should be asked for soon after the death has occurred. Often it is best to make the request at once whenever the proper relative of the deceased is present in the hospital. Reasonable consideration should be accorded to everyone concerned in determining when the matter has been adequately presented and the final decision reached.

8. Arrangements should be worked out in every hospital whereby the unnecessary loss of time on the part of the funeral director may be obviated and the funeral director should be instructed that he will be promptly informed

by telephone when the death certificate is signed and the body is ready for him.

The telephoned information in regard to the dead, particularly before a funeral director is known to have been engaged, should be given only by an executive officer of the hospital and should be carefully guarded unless the persons on the wire are personally known.

9. Interference by a funeral director with the legitimate efforts of the hospital to obtain permission for autopsy shall be regarded as a reportable grievance.

C. *Technic of the Necropsy.*

1. The prosector should perform his examination in such a way as to facilitate the subsequent work of the embalmer and funeral director. The main longitudinal incision should end over the mid-sternum and curved incisions with concavity toward the head should be carried laterally to either shoulder, especially to provide for decollete in the female. In general, ligature about each carotid should be left hanging out of the sutured incision at the finish. When the skull is opened the frontal bone should be cut above the hair line and the base of the skull cemented with plaster before replacing the skull cap. When the neck organs and tongue are removed, the head should first be embalmed through the carotids unless there is a serious contra-indication. An embalmer, representing the funeral director, should be a welcome associate at the necropsy table.

2. During the necropsy, the skin should be kept free from blood or other material which may be adherent if neglected and allowed to dry.

3. The necropsy should be completed and the body prepared ready for the funeral director punctually at the time promised whenever there has been an advance agreement in regard to this matter.

D. *Special Recommendations.*

1. We recommend the approval of this report by the Metropolitan Funeral Directors' Association, the New

York Pathological Society, and The New York Academy of Medicine.

2. We recommend that printed copies be distributed (a) to the members of the Metropolitan Funeral Directors' Association and to such other funeral directors as may request such copy; (b) to the superintendents of hospitals in the City of New York; (c) to the members of the New York Pathological Society.

3. We recommend the appointment of a continuing Joint Committee, made up of one or more representatives of each of the following groups: (a) The Metropolitan Funeral Directors' Association, (b) The New York Pathological Society, and (c) The New York Academy of Medicine, with authority to associate with them a representative of the hospital executives. It is understood that this Committee shall inquire into grievances as they may arise in regard to necropsy service, and may from time to time make further recommendations to their respective organizations.

4. We recommend that this report be brought to the attention of the American Hospital Association, the American Association of Pathologists and Bacteriologists, the American Medical Association, the American College of Surgeons, the American College of Physicians, the National Association of Selected Morticians, and the National Funeral Directors' Association, through the agency of the New York Academy of Medicine.

April 8, 1931.

Approved by the Council of The Academy of Medicine on May 27, 1931.

POLIOMYELITIS IN NEW YORK CITY

Progress Report of the Sub-committee

In 1928 the Public Health Committee appointed a sub-committee consisting of Drs. Royal S. Haynes, George Draper, W. Lloyd Aycock, William H. Park, Simon Flexner, Josephine B. Neal, Philip Van Ingen, Harold L. Amoss, E. H. L. Corwin and Linsly R. Williams, to carry out an experiment on the treatment of early cases of poliomyelitis with human convalescent serum.

A small sum of money was secured and human convalescent serum obtained from a large number of individuals, the majority of whom offered their blood in order to help others. This serum was collected by a number of younger physicians, chiefly at the Cornell Clinic. The Committee expresses its appreciation to the staff of the Clinic for its most helpful coöperation.

A number of the younger physicians in the city who were interested in the scheme have coöperated with the Committee in the administration of the serum. The following brief report of the work done by these young physicians has been prepared by Dr. Alfred E. Fischer:

The results of the work have been encouraging enough to warrant further study. While no complete analysis as yet has been made because of insufficient data, the Committee feels that a preliminary statement of the results of the therapy may be made at this time.

In 1928 there were 61 cases of poliomyelitis treated with serum. Twenty-one of this number were preparalytic of which 3 died. Of 12 cases in which paralysis was present less than 12 hours, 2 died, a mortality of 15 per cent. The remaining cases were paralyzed longer than 12 hours when serum was administered. Thirteen out of 30, a mortality of 33 per cent, died in the latter group. This compares with

a mortality of 29 per cent of 67 cases treated at Willard Parker Hospital during the same year, and a general city mortality of 26 per cent.

In 1929 there were 71 and in 1930, 78 cases of poliomyelitis in the city. Only 3 cases of preparalytic poliomyelitis in 1929 received serum, and 1 in whom paralysis was present less than 12 hours also received serum. None of these died.

In 1930, 6 preparalytic cases and 1 in whom paralysis was present less than 12 hours were treated. None of these died. The total number of preparalytic cases treated during the 3 years was 30 and 14 patients were treated in whom paralysis was present less than 12 hours.

The mortality of poliomyelitis in New York City during the year 1929 was 35 per cent and during 1930 was 16 per cent. In each of these years the morbidity was low and the difference in mortality does not necessarily mean an increased virulence of the disease in 1929. It suggests rather an insufficient number of cases upon which to make a comparison and reminds us that large groups of cases must be used when estimating therapeutic results.

The extent to which paralysis has been modified in cases that have received serum is beyond the scope of this report. In years when the morbidity is high a comparison of treated and untreated cases can be made with regard to end-results. In non-epidemic years the number is too few for comparison.

The following case, which was treated by Dr. J. M. Lewis, is typical of the group we have been studying:

A. B., 8 years old, became ill on September 27th, 1930. He vomited and had a temperature of 102° on that day. On September 30th his neck became stiff and on October 4th and 5th, he developed a paralysis of some of the muscles of his right arm and both lower legs.

His young brother, J. B., age 3 years, became ill on October 5th with a temperature of 103° and the following

day his neck became somewhat stiff. He was flushed, had an injected throat and his spine was rigid. His deep reflexes were exaggerated and he had a slightly positive Kernig sign. Because of these symptoms and the fact that the brother had a definite poliomyelitis, a lumbar puncture was done 33 hours after the onset. The spinal fluid was clear, contained 40 cells of which the majority were lymphocytes. At the same time 20 c.c. of convalescent poliomyelitis serum was given intraspinously and 40 c.c. intravenously. The following day a second dose of 20 c.c. was given intraspinously. Due to the serum there was an increase in the rigidity of the neck and spine but within a week this had cleared up. When seen on October 20th, 15 days after the onset of his illness, he had no paralysis in striking contrast to the disease in his brother.

This was a contact case of poliomyelitis which when seen by one of the members of the Poliomyelitis Committee was in the preparalytic stage. The presence of the disease in the brother suggested the diagnosis which was confirmed by the clinical symptoms and spinal fluid findings.

The work will be continued this year and physicians are asked to notify the Academy of early and suggestive cases so that the diagnosis can be verified by a member of the Committee and serum injected. A therapeutic result is always most difficult to evaluate and it is only by a carefully controlled study over a period of time that the efficacy of the serum can be accurately determined.

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OBITUARY NOTICES

Charles North Dowd

Dr. Charles North Dowd, a Fellow of the Academy of Medicine since 1889, died on May 24th, 1931 in his seventy-fourth year at his home in Saratoga Springs. Dr. Dowd had retired from practice four years ago.

He graduated from Williams College in 1878, and from the College of Physicians and Surgeons in 1886. He had served as Attending Surgeon at the Memorial Hospital from 1894 to 1914, at St. Mary's Free Hospital for Children from 1905 to 1914, and at the Roosevelt Hospital from 1914 to 1924. He also served as Consulting Surgeon at the Roosevelt and St. Mary's Hospitals. He was a Major in the United States Army Medical Corps from 1917 to 1919. He was Professor of Clinical Surgery at the College of Physicians and Surgeons, and was a member of many medical societies, and made many contributions to surgical literature.

In the death of Dr. Dowd the Academy of Medicine has lost a Fellow who was at all times keenly interested in promoting the ideals of the profession and who gave freely of his time and talents to make available the opportunities for advanced medical education in New York. He was chairman of the Committee on Medical Education for the first two years of its existence.

The activities of the Bureau of Information which are now carried out by the Committee on Medical Education of the Academy had its origin in a meeting held in 1912 in the office of Dr. Lucius Hotchkiss at which were present Charles N. Dowd, Howard C. Taylor and the writer. At that meeting the "Society for the Advancement of Clinical Study" was formed for the purpose of maintaining a bureau of information for visiting and local physicians in order that the vast facilities that existed in New York might be made readily accessible to those desiring them.

At that time there was no central bureau where a visitor could learn what surgical and medical clinics were going on each day. The Council of the Academy generously provided a room in the building for the necessary office and also space in the hall for a large bulletin board for the posting of clinics and information.

The work of the Society was financed entirely by subscriptions from those interested. It met with success from the start and was carried on until 1923 when its activities were transferred to the Academy of Medicine and the work taken over by the Committee on Medical Education.

Dr. Dowd was the President of this Society from its inception until it was dissolved in 1923, and its success was largely due to his personal efforts and devotion to its objects. Through his wise guidance the Society was safely launched and developed into a strong agency for the promotion of post-graduate medical education by making available the abundant clinical opportunities of New York to the profession. This work is now being carried on today and expanded into broader fields by the Committee on Medical Education.

The Academy owes a debt of gratitude to Dr. Dowd for this pioneer work in promoting post-graduate medical education.

GEORGE GRAY WARD.

SHIBASABURO KITASATO

The death of Shibasaburo Kitasato in Tokyo on June 13, 1931, recalls the great days of the beginnings of bacteriology, when Pasteur and Koch and a host of other workers were finding new pathogenic organisms nearly every year. Kitasato, one of Koch's most brilliant pupils, worked chiefly in the Institute for Infectious Diseases in Berlin during his active career. Later he returned to Japan, devoted himself to teaching and administrative work, and ceased to be a fruitful scientific investigator.

His best known Japanese pupils of this period are Shiga and Noguchi. His name will always be associated with three important discoveries. In 1889 he found a method of obtaining pure cultures of the tetanus bacillus, which Nicolaier had previously discovered in 1884 by inoculation of animals with samples of earth. Kitasato's high technical skill enabled him to devise a means for removing the contaminating organisms and then grow the tetanus organism in an atmosphere of hydrogen. In 1890 Kitasato published with von Behring a classical paper on immunization against tetanus, which has become the basis for the production and wide use of this anti-serum at the present time. A week later von Behring published a paper on immunization against diphtheria anti-toxin, the toxin itself having been discovered shortly before in the Pasteur Institute by Roux and Yersin, so that to von Behring and Kitasato must be granted the splendid achievement of the discovery of practical anti-toxic immunity. After this discovery Kitasato published many interesting observations concerning the varying susceptibility of animals to tetanus toxin, horses being the most susceptible, while fowls require 300,000 times as much toxin as the horse to produce symptoms. He showed that the organs of an animal dead of tetanus are non-toxic and even the central nervous system, in which toxin might be suspected of accumulating, was harmless on injection into animals.

In 1894 a great plague epidemic was raging in China, and the Japanese Government sent Kitasato and Aoyama to Hong Kong on the 12th of June. On the 14th an autopsy was performed on a patient, and Kitasato found the B. pestis in the lymph nodes, blood, spleen, and other organs. Kitasato also discovered the plague bacillus in the blood of a living human case. Cultures were readily effected, and animal inoculation of the pure cultures showed that the organism of the Black Death had been discovered. Only a few days later the French bacteriologist, Yersin, arrived from Saigon and was able to confirm Kitasato's results.

Kitasato returned to Japan and there founded in 1892 the Governmental Institute for Bacteriology, and the Kitasato Institute for Infectious Diseases in Tokyo in 1914. While his name will always be associated with some of the most important discoveries in bacteriology, his achievements were due more to industry and skilled laboratory technique under the tuition of his great teacher, Dr. Koch than to great original genius. He therefore cannot be ranked intellectually with Koch, Pasteur, or even Loeffler and von Behring, who made the great fundamental discoveries in the golden era of bacteriology, despite the fact that his work was of high caliber and of great practical importance. FRANCIS CARTER WOOD.

DEATHS OF FELLOWS OF THE ACADEMY

EUGENE LYMAN FISKE, M.D., 25 West 43 Street, New York City; graduated in medicine from the University of the City of New York, New York City, in 1888; elected a Fellow of the Academy November 4, 1909; died, July 5, 1931. Dr. Fiske was a Fellow of the American Medical Association, a member of the County and State Medical Societies, a member of the American Public Health Society, the American Society for the Advancement of Science and a member of the National Tuberculosis Association. Dr Fiske was Medical Director of the Life Extension Institute from the time of its organization in 1913 until his death.

ALLEN FITCH, M.D., 16 East 96 Street, New York City; graduated in medicine from Union University, Albany, N. Y., in 1879 and from the University of the City of New York, in 1880; elected a Fellow of the Academy June 4, 1896; died, June 29, 1931. Dr. Fitch was a member of the County and State Medical Societies, a member of the Neurological Society and a member of the Society of Alumni of Bellevue Hospital.

LOUIS ADOLPH KOCH, M.D., 16 Chestnut Street, Newark, N. J.; graduated in medicine from the University of Maryland, Baltimore, Maryland, in 1902; elected a Fellow of the Academy May 6, 1909; died, July 7, 1931. Dr. Koch was head of the Dermatology Department of the Newark Dispensary, on the staff of the Newark City Hospital and a member of the New Jersey Medical Society.

JOHN OSBORN POLAK, M.D., 20 Livingston Street, Brooklyn, N. Y.; graduated in medicine from the Long Island College Hospital and the University of Vermont, Medical Department, in 1891; elected a Fellow of the Academy June 6, 1895; died, June 29, 1931. At the time of his death Dr. Polak was a Vice-President of the Academy. He was a Fellow of the American Medical

Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, a member of the American Association of Obstetrical, Gynecological and Abdominal Surgeons, a member of the American Board of Obstetrics and Gynecology, a member of the American Gynecological Society, New York Obstetrical, Gynecological and Pathological Societies; Professor of Obstetrics and Gynecology to Long Island College Hospital Medical College, Gynecologist and Obstetrician the Long Island College Hospital, Consulting Gynecologist to Bethony Deaconess, Jewish, Caledonia, Coney Island and Israel-Zion Hospitals, Brooklyn, People's Hospital, New York. He was Consulting Obstetrician to the Methodist Episcopal Hospitals of Southampton, L. I. and Nyack, N. Y.

MEYER MAURICE STARK, M.D., 156 West 86 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1899; elected a Fellow of the Academy January 4, 1912; died, June 18, 1931. Dr. Stark was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, and a member of the Society of Associated Alumni of Mt. Sinai Hospital. He was connected with the gynecological departments of Mt. Sinai, Sydenham, Knickerbocker and Community Hospitals. He was also on the gynecological department staff of the Beth Israel Hospital dispensary and was an instructor in the department of experimental surgery of the New York University Medical School for two years.

JARVIS SHERMAN WIGHT, M.D., 30 Schermerhorn Street, Brooklyn, N. Y.; graduated in medicine from the Long Island Medical College, Brooklyn, N. Y., in 1895; elected a Fellow of the Academy March 7, 1918; died, July 7, 1931. Dr. Wight was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the County and State Medical Societies, a member of the American Society for the Advancement of Science, a member of the Pathological and Surgical Societies and Surgeon to the Long Island College Hospital.